

WHAT IS CLAIMED IS:

1. A method for protecting traffic in a WDM-based ring-topology optical transport network, said network comprising network elements joined by spans, optical paths being defined between said network elements, the method comprising the steps of:

- i. defining a network architecture;
- ii. defining configuration data of the network elements;
- iii. defining criteria triggering the protection mechanism;
- iv. defining a mechanism state machine and a protocol for exchanging information between the network elements, the protocol comprising a set of messages and both the syntax and semantics thereof;
- v. defining a method for traffic re-routing; and
- vi. defining a set of operator commands for network maintenance,

wherein said step i) comprises the step of defining a network wherein the whole capacity is evenly splitted between working capacity and protection capacity; said step ii) comprises the steps of providing each network element with a ring network map, a traffic map with path characteristics and bit rate of each path; said step iii) comprises the step of considering as triggering criteria the defects at OMS section level or the network element failures; said step iv) comprises the step of defining as state machine and protocol fundamentally those described in ITU-T G.841; and said step vi) comprises the step of defining as operator commands those described in ITU-T G.841, wherein the terms and concepts which are specific for SDH transmissions are replaced by those corresponding to OTN networks.

2. A method according to claim 1, wherein said step v) comprises the step, carried out by the network elements which are adjacent to a failure/command, of performing a Bridge & Switch so that the traffic is restored at Optical Multiplex Section level and

- in case of a span failure/command in the ring network, traffic normally travelling on the working channel will be transported on the corresponding spare channel of the same span;
- in case of a ring failure/command in the ring network, traffic normally travelling on the working channel will be transported on the corresponding spare channel through a loopback.

3. A method according to claim 1, wherein said step v),
- in case of a span failure/command in the ring network, the network elements which are adjacent to a failure/command carry out, optical path-by-optical path, a Bridge & Switch

so that traffic normally travelling on the working channel will be transported on the corresponding spare channel of the same span;

- in case of a ring failure/command in the ring network, the path insert/drop network elements carry out a Bridge & Switch by re-routing on the semi-ring network which does not comprises the failed span.

4. A method according to claim 1, wherein said step of providing each network element with a traffic map comprises the step of providing the network elements with information comprising identifiers of network elements which are in communication with each other, the channel which is used by each path and the path direction.

5. A network element to be used in an optical fiber transport network having a ring topology and WDM technology based, said network comprising network elements joined by spans, optical path being installed between said network elements, said network element comprising:

- i. means for receiving/storing network architecture information;
- ii. means for receiving/storing configuration data of the network element;
- iii. means for receiving/storing criteria triggering the protection mechanism;
- iv. a mechanism state machine and means for receiving/storing a protocol for exchanging information between the network elements;
- v. means for receiving/storing a method for traffic re-routing; and
- vi. means for receiving/storing a set of operator commands for network maintenance,

wherein said means for receiving/storing configuration data comprise means for receiving/storing a ring network map, a traffic map with path characteristics and bit rate of each path.

6. A computer program comprising computer program code means adapted to perform all the steps of claim 1 when said program is run on a computer.

7. A computer-readable medium having a program recorded thereon, said computer-readable medium comprising computer program code means adapted to perform all the steps of claims 1 when said program is run on a computer.